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ROSEN AVIATION

# 17" SlimLine Display with DVI Input

# Technical Manual

**Model 1700-003**

**ELECTRONIC REVISION CONTROLLED**

Document Number: 102031 Rev B

***Technical Manual, 17” SlimLine Display with DVI Input***

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# 1. INTRODUCTION AND DISPLAY OVERVIEW

This manual describes how to install the Rosen 17” SlimLine Display with DVI Input onto your aircraft. It contains everything you need to know to wire the display and confirm that it is functioning correctly.

The display receives Composite, Analog RGB, and DVI video input. DVI input is shown as Digital RGB in the on-screen display when switching between video sources.

**Note:** Only trained and qualified personnel should perform installation and service.

## 1.1. Unpacking

Parts shipped with the 17” SlimLine Display with DVI Input:

- Outline & Installation Drawing
- 17” Display with DVI Input
- Main Interface Connector kit (P/N **0300-021**)
- Optional equipment sold separately:
  - External 7-button Controller (P/N **0300-402**) shipped with *Remote Controller Technical Information* (P/N **100434**)
  - DVI Connector Kit (P/N **0300-029**)

**NOTICE** For more information about *Outline & Installation* drawings, please contact Rosen Aviation Customer Service at 541.342.3802.

# 2. INSTALLATION GUIDELINES

There are several ways to connect the 17” Display with DVI Input to an aircraft’s entertainment system.

Use the pinout descriptions on page 2 of the *Outline & Installation* drawing to assist in the wiring process. Pay close attention to the pinout information while completing wiring connections.

**Note:** This display is for entertainment purposes only; connect to the non-critical power bus.

Drawings are provided to assist in the installation process. Pay close attention to dimensions and rotations when considering installation requirements.

**NOTICE** Touching the LCD with excessive force may leave pressure spots that show in video display. Handle with care.

## 2.1. Cooling and Ventilation

The display is cooled by the flow of air, or natural convection. Special care must be taken with the installation to provide a proper environment for air flow.

- Display vents: The unit is designed with vent openings on the top, bottom, and rear surfaces. The entire top vent, and either the entire bottom or entire rear vent must be unobstructed for a minimum of one (1) inch. The vents must also be ducted to free air.
- Ducting: The installation must provide for an inlet duct (at bottom or rear), and an exhaust duct at the top. Each of these ducts must have a minimum of four (4) square inches of cross-sectional area.

**Note**: Display backlight will shut down if internal temperature reaches 140° F.

**Note**: Each mounting hole includes a 10-32 screw. To install the display, remove only the screws that will be used to install the display. Do not remove the 4-40 flathead screws.

**Note**: Application requires listed connector backshell (Positronic D37000GEO-1023.5) due to space constraints and 21WA4 combo connector.

## 2.2. Mounting Options

This display can be mounted from any combination of two sides.

(Dimensions in inches)

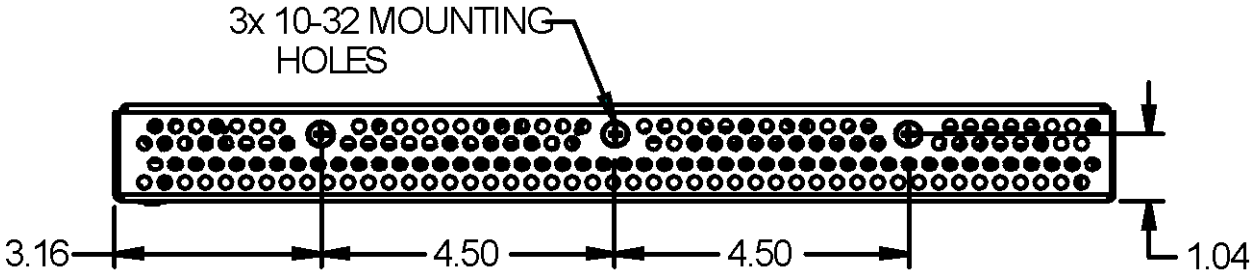



Figure 1 Top view with mounting holes

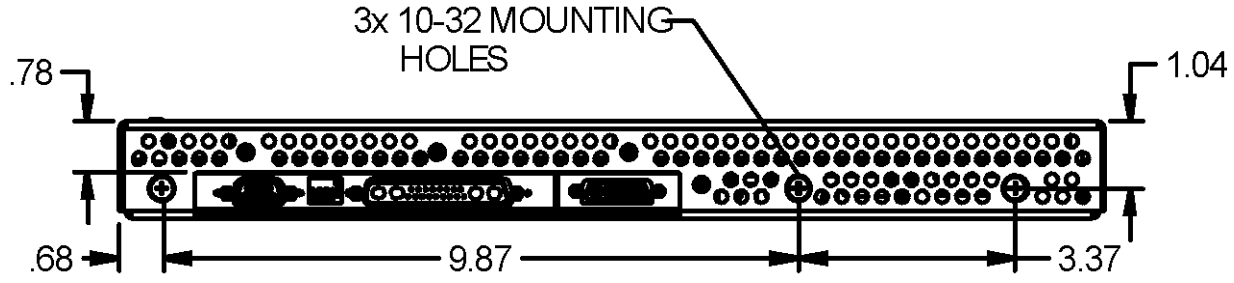
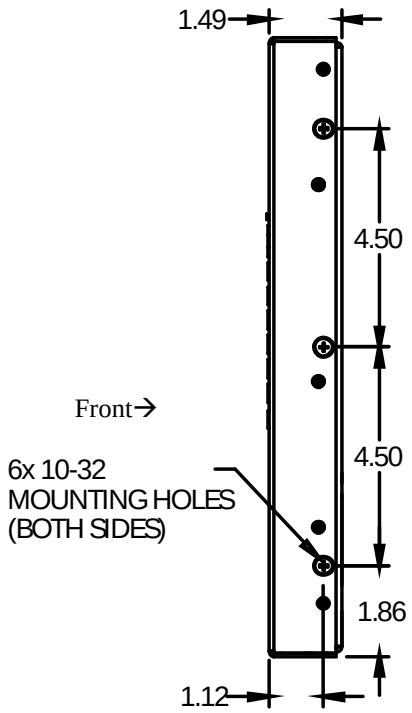



Figure 2 Bottom view with mounting holes




| **Warning!** | Maximum screw penetration depth: | |
|---|---|---|
| ! | Top | .75 inches |
| | Bottom | .75 inches |
| | Sides | .75 inches |
| | Rear | .50 inches |

Figure 3 Side view with mounting holes (3 per side)

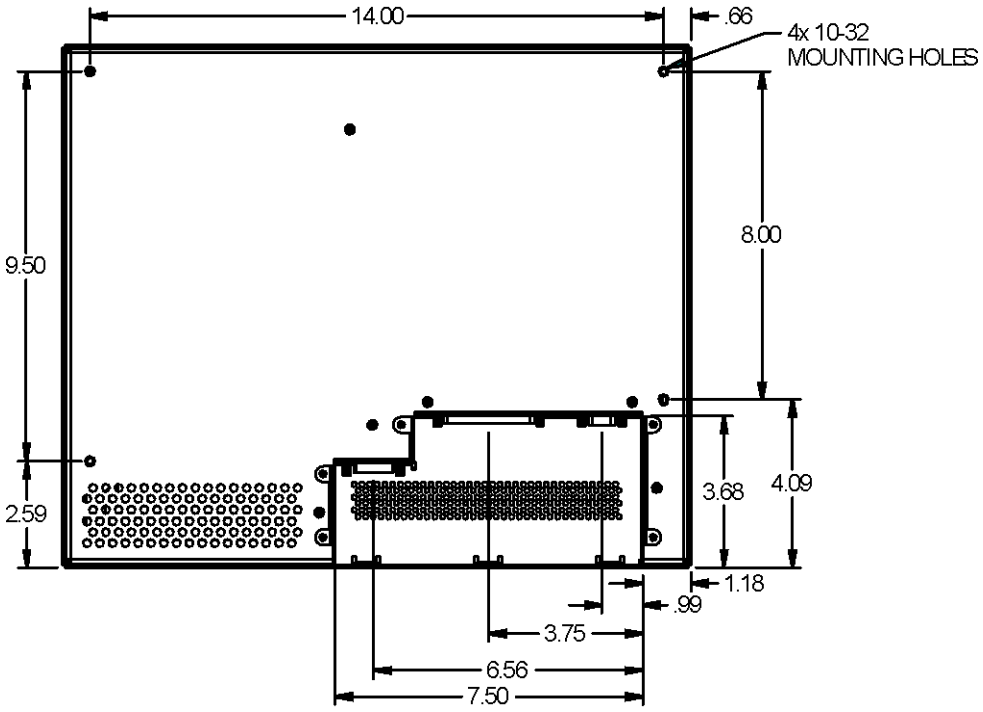



Figure 4 Rear view with mounting holes

# 3. VIDEO CONNECTIONS

## 3.1. Main Interface Connector

The main input connector on this display is a 21W4 Male Combo D-subminiature with 17 size-20 contacts (standard density D-sub) and four size-8 coaxial contacts, mounting in a size-4 D-subminiature shell.

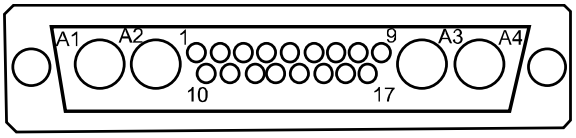
Recommended mating connector: ITT Cannon: (P/N **9000879**).

**Note:** Backshell of main connector is Positronic D37000GEO-1023.5.

**Warning!** Do not plug or unplug display while power is applied!

Main Interface Connector

| Pin # | Display Signal |
|---|---|
| 1 | 28V return |
| 2 | +28VDC |
| 3 | IR +5V |
| 4 | IR signal |
| 5 | Reserved |
| 6 | RGB/video select (TTL) |
| 7 | Status output (TTL) |
| 8 | Hsync |
| 9 | Vsync |
| 10 | 28V return |
| 11 | 28V |
| 12 | IR ground |
| 13 | Computer sync ground |
| 14 | Reserved |
| 15 | Digital ground |
| 16 | Digital ground |
| 17 | Digital ground |
| A1-signal | Red |
| A1-shield | Red return |
| A2-signal | Green |
| A2-shield | Green return |
| A3-signal | Blue |
| A3-shield | Blue return |
| A4-signal | Composite video |
| A4-shield | Composite video return |




Rear view of the Main Interface Connector

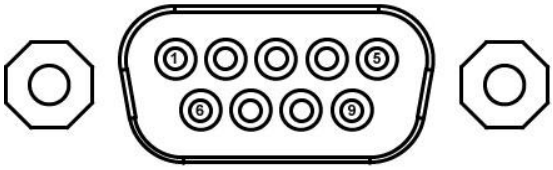
### 3.1.1. Main Connector Functions

| Signal | Input/Output | Description |
|---|---|---|
| +28V, 28V Return | Input | Aircraft power supply |
| IR +5V, IR GND | Output | Power for optional External IR receiver |
| IR Signal | Input | IR receiver signal input |
| RGB/Video Select Switch | Input | TTL level input. Used to select which input (RGB or Composite) is displayed. Method of selection set by DIP switches. Refer to DIP Switch Option Selection on page 10. |
| Status Output | Output | TTL level output indicates display is powered on when logic High (Max. current draw is 10 milliamps) |
| H-Sync, V-Sync | Input | RGB graphics input, TTL level |
| Computer Sync GND | Input | Reference ground for RGB sync |
| Digital GND, pins 15, 16, 17 | Input | Common digital ground connection, connected to Computer sync GND |
| A1 Signal/Shield | Input | Red graphics input, 1 Vpp, 75 ohm |
| A2 Signal/Shield | Input | Green graphics input, 1 Vpp, 75 ohm |
| A3 Signal/Shield | Input | Blue graphics input, 1 Vpp, 75 ohm |
| A4 Signal/Shield | Input | Composite video input, 1 Vpp, 75 ohm |

### 3.1.2. External Control Interface (0300-402)

The external VIP control interface is a 9-pin standard density D-subminiature male connector. Each function can be activated by a momentary connection to ground.

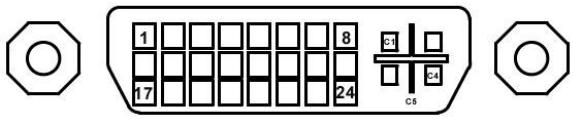
| Pin # | Signal |
|---|---|
| 1 | Power On/Off |
| 2 | Source Select |
| 3 | NC |
| 4 | Up |
| 5 | Down |
| 6 | Menu Select |
| 7 | Left |
| 8 | Right |
| 9 | Ground |




Rear view of the External Control Connector

### 3.1.3. DVI Connector (P/N 0300-029)

| Pin # | Signal |
|---|---|
| 1 | Data 2- |
| 2 | Data 2+ |
| 3 | Data 2 RTN |
| 4 | Reserved |
| 5 | Reserved |
| 6 | Reserved |
| 7 | Reserved |
| 8 | Reserved |
| 9 | Data 1- |
| 10 | Data 1+ |
| 11 | Data 1 RTN |
| 12 | Reserved |
| 13 | Reserved |
| 14 | VCC |
| 15 | Reserved |
| 16 | H Plug |
| 17 | Data 0 - |
| 18 | Data 0 + |
| 19 | Data 0 RTN |
| 20 | Reserved |
| 21 | Reserved |
| 22 | Clock RTN |
| 23 | Clock + |
| 24 | Clock - |
| C1 | Reserved |
| C2 | Reserved |
| C3 | Reserved |
| C4 | Reserved |
| C5 | Reserved |




Rear view of the DVI Connector

## 3.2. DIP Switch Option Selection

Use DIP switches located near the input connectors. See Section 3.2.1 (below) for detailed descriptions. Operation is as follows:

| SWI | SW2 | SW3 | SW4 | Function |
|---|---|---|---|---|
| On | Off | - | - | Constant Ground – No DVI |
| Off | On | - | - | Momentary Ground – No DVI |
| On | On | - | - | Auto-detect (RGB) |
| Off | Off | - | - | Momentary Ground – DVI |
| - | - | Off | - | Display defaults to Off (Auto Off) |
| - | - | On | - | Display defaults to On (Auto On) |
| - | - | - | On | Front Switch Panel Enabled |
| - | - | - | Off | Front Switch Panel Disabled |

The display may be configured to several options through the setting of DIP switches located near the input connectors. The DIP switch settings are detected when 28 volts are applied, and each time the power button is pressed to turn on the display.

### 3.2.1. DIP Switch Function Descriptions

**Note:** DVI video is also shown as Digital RGB when switching between video sources.

**Auto-Detect**

When the RGB/Video Select pin (pin 6 of the 21WA4 combo connector) is connected to ground, DVI is selected for display. When the RGB/Video Select pin is not connected to ground, Composite is selected for display. In this mode, when either Composite or Digital RGB (DVI) is selected for display via the RGB/Video Select pin and an analog RGB signal becomes present, the display will automatically switch to the analog RGB signal. It will return to whatever source was selected after the analog RGB signal is removed. The Source button located on the front panel membrane switch and optional external switch controller will be locked out.

**Constant Ground — No DVI**

This mode uses the Source Select discrete input to switch between RGB and Composite video inputs only. This mode uses a SPST (single-pole, single-throw) external rocker switch connected between ground and RGB/Video Select (pin 6 of the 21WA4 combo connector). When the RGB/Video Select pin is connected to ground, the display will switch to the RGB input whether an RGB signal is present or not. When the RGB/Video Select pin is not connected to ground, the display will switch to the Composite Video input whether a video signal is present or not. The Source button located on the front panel membrane switch and optional external switch controller will be locked out.

**Momentary Ground — No DVI**

This mode uses the Source Select discrete input to toggle between RGB and Composite video inputs only, based on a momentary ground. This mode uses a SPST external momentary switch between ground and the RGB/Video Select (pin 6 of the 21WA4 combo connector). Each time the switch is pressed, the display will switch back and forth between the Analog RGB and Composite Video inputs whether a signal is present or not. The Source button located on the front panel membrane switch and an optional external switch controller can also be used to switch between the RGB and Composite Video inputs.

**Momentary Ground — DVI**

This uses the Source Select discrete input to toggle between Analog RGB, Digital RGB (DVI), and Composite video based on the momentary ground input. The Source button located on the front panel membrane switch and optional external switch controller can be used to switch between the RGB, DVI, and Composite Video inputs.

**Automatic Power-Up**

**SW3 On:** The display will come on as soon as 28-volt power is applied.

**SW3 Off:** The display stays off when 28-volt power is applied. The power button on the front panel membrane switch or the optional external switch controller must be pressed to turn on the display.

**Membrane Switch Enable**

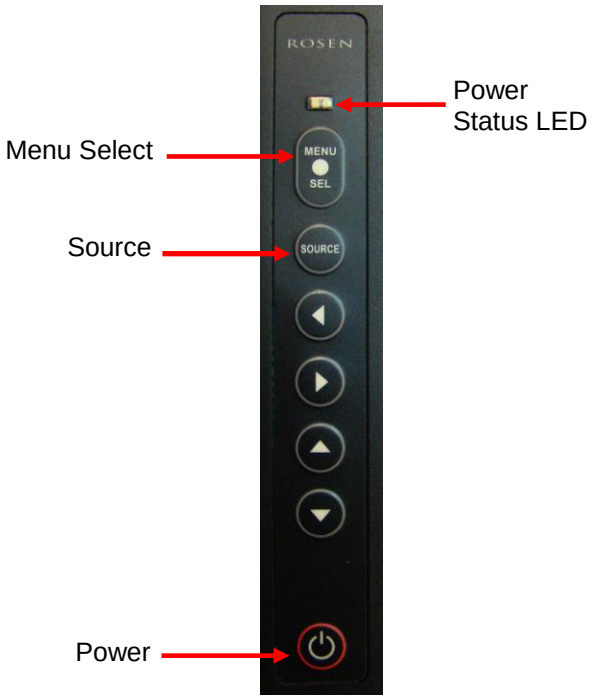
**SW4 On:** Front panel membrane switch is enabled.

**SW4 Off:** Front panel membrane switch is disabled

# 4. OPERATION

## 4.1. Front Switch Panel Features

To operate the 17” SlimLine display, use the front switch panel buttons shown below. (External controller or IR remote control options are available separately.)




| Feature | How it Works |
|---|---|
| Power Status LED | When the LED is green, the display is on. When the LED is red, the display is in Standby Mode. |
| Menu/Sel | Press to view the OSD Main Menu and to select the highlighted Main Menu option. |
| Source | Press to toggle the video source between Analog RGB, Digital RGB (DVI), and Composite video. **Note**: This only functions when DIP switch is set to Momentary Ground or Manual mode. |
| ▼ ▲ ▶ ◀ | Press to select a menu option or to increase or decrease a value. |
| Power | Press to power the display on or off. |

## 4.2. On Screen Display (OSD) Main Menu

The On Screen Display (OSD) provides a set of menus that enable you to adjust or view display features. Main Menu selections lead to submenus with additional choices. Press the Menu/Select button on the switch panel to open the Main Menu.

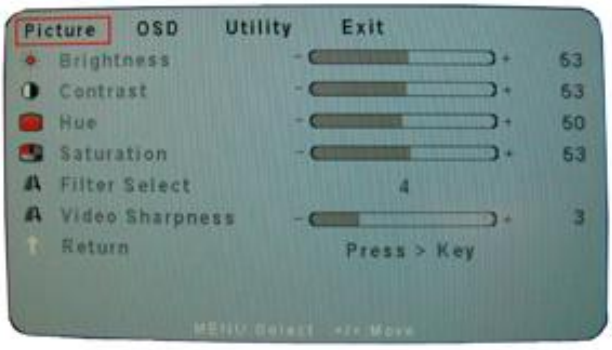



Figure 5 Composite Main Menu

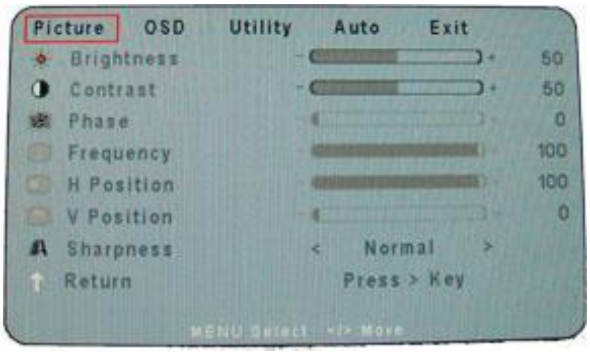



Figure 6 RGB Digital (DVI) Main Menu

To switch to different Main Menus (OSD, Utility, Auto), press the ◄► buttons on the front switch panel.

To highlight a submenu, press the ▼ button on the switch panel. When submenus are highlighted, press the ◄► buttons to adjust the values.

To return to the Main Menu, press the ► button on the switch panel to highlight **Return** in the submenu.

To exit Main Menu, press the ► button until **Exit** is highlighted and then press the **Menu Select** button.

**Note:** It takes five seconds for changes to be stored into memory.

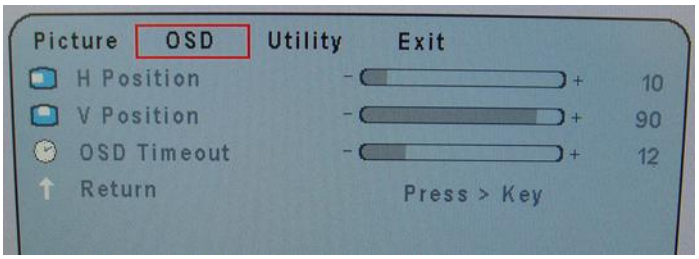
## 4.3. Picture Submenu

| Menu Option | How it Works |
|---|---|
| Brightness | Adjusts picture brightness |
| Contrast | Adjusts picture contrast |
| Hue (Composite Only) | Shifts the color balance or tint |
| Saturation (Composite Only) | Intensifies the image colors |
| Filter Select (Composite Only) | Increases the clarity of the picture |
| Phase | Removes noise in Analog RGB mode |
| Frequency | Adjusts the picture size in Analog RGB mode |
| H Position | Adjusts horizontal position adjustment |
| V Position | Adjusts vertical position |
| Sharpness | Adjusts picture sharpness |
| Return | Returns OSD to the Main Menu |

These options gray out and are not available with the RGB/DVI mode

**Note**: Phase, Frequency, H Position, and V Position appear only in analog RGB/DVI mode.

## 4.4. OSD Submenu




| Menu Option | How it Works |
|---|---|
| H Position | Adjusts OSD horizontal position |
| V Position | Adjusts OSD vertical position |
| OSD Timeout | Adjusts time in which OSD turns off if left alone |
| Return | Returns OSD to the Main Menu |

## 4.5. Utility Submenu

| Menu Option | How it Works |
|---|---|
| Freeze Frame | Freezes picture frame |
| Reset | Returns options to default settings |
| Special Filter | Slow/fast motion picture filter |
| Color Temperature | Adjusts color in Composite and DVI modes |
| Information | Shows the operating status of the display |
| Return | Returns you to Main Menu |

This option grays out and is not available with the RGB/DVI mode

**Note**: Digital RGB mode (DVI/1080p) will not display correctly with special filter enabled. Special filter can only be enabled in composite mode.

## 4.6. Auto Submenu

| Menu Option | How it Works |
|---|---|
| Auto | Automatically adjusts image size in RGB modes |

## 4.7. Exit Submenu

| Menu Option | How it Works |
|---|---|
| Exit | Closes the screen. To exit menu, press ◄. |

## 5. HOT KEYS

Hot keys are a quick way of adjusting brightness, contrast, picture-in-picture (PIP), and the scaling modes without going through the OSD menu. To activate the hot keys, simply press the ▲▼buttons on the switch panel to cycle through these modes, then use ►◄ buttons to change values. The hot keys will not work if an OSD menu is open.

| Hot Key Option | How it Works |
|---|---|
| Scaling mode | The scaling mode will adjust the picture depending on the type of formatted DVD disc you are using. **Note**: If picture looks stretched, adjust scaling mode.<br>● Fill All<br>● Fill Aspect Ratio<br>● One To One<br>● Letterbox 16:9 fill (tall) [Composite Only]<br>● Anamorphic [Composite Only] |
| Picture-in-Picture (PIP) [RBG/DVI only] | The small screen in the upper left-hand corner will display composite video in small, medium, and large PIP when in RGB/DVI modes. **Note**: PIP will only function correctly with progressive video signals. It will not function with interlacing video signals (480i/1080i). |

## 6. TECHNICAL REFERENCES AND SUPPORT

If the display does not function properly, refer to the following troubleshooting table for symptoms and possible solutions before contacting Rosen field support.

- Always use an oscilloscope to verify the video signal
- Always use a multimeter to verify voltages
- Check actual results against the requirements described in this manual

| Problem | Possible Solutions |
|---|---|
| No Video | • Verify that the video source is on and has a tape or DVD installed.<br>• Verify that a signal is reaching the display by using an oscilloscope or another display.<br>• Verify that the display is turned on (LED is green).<br>• Verify that the pinout is correct.<br>• Verify that the video input (Analog RGB/DVI/Composite) and video standard (NTSC/PAL/SECAM) match your application. |
| Screen is Black | • Verify that the display is receiving power.<br>• Verify that the pinout is correct.<br>• Verify that the video source is on and has a tape or DVD installed.<br>• Verify all connections. |
| Screen is Blue | • Verify that a signal is reaching the display by using an oscilloscope or another display.<br>• Verify that the pinout is correct.<br>• Verify that the video source is on and has a tape or DVD installed. |
| Color is Out of Adjustment | • Refer to the OSD Main Menu options described on page 13. |
| Image Flickers | • Verify that the signal cable is secure.<br>• Verify that the vertical frame frequency is 75 Hz or less. If using the display with a PC in Windows, go to Control Panel→Display Properties and change the Display Control Panel to 60 Hz to achieve the best performance. |
| Image is distorted | • Verify pinouts.<br>• Verify that a signal is reaching the display by using an oscilloscope or another display.<br>• Examine the display for pinched or damaged cables. |

# 7. DO-180E QUALIFICATIONS

DO-160E Test criteria to which we test the 1700-003 series displays

| Description | DO-160E Section | DO-160E Category |
|---|---|---|
| Temperature and Altitude | 4.0 | A1 |
| Temperature Variation | 5.0 | C |
| Humidity | 6.0 | A |
| Operational Shock & Crash Safety | 7.0 | B |
| Vibration | 8.0 | SB |
| Explosion Proofness | 9.0 | N/A |
| Waterproofness | 10.0 | N/A |
| Fluids Susceptibility | 11.0 | N/A |
| Sand & Dust | 12.0 | N/A |
| Fungus Resistance | 13.0 | N/A |
| Salt Spray | 14.0 | N/A |
| Magnetic Effect | 15.0 | Z |
| Power Input | 16.0 | AB |
| Voltage Spike | 17.0 | B |
| Audio Frequency Susceptibility — Power Inputs | 18.0 | Z |
| Induced Signal Susceptibility | 19.0 | Z |
| Radio Frequency Susceptibility (Radiated & Conducted) | 20.0 | TT |
| Emission of Radio Frequency Energy | 21.0 | B |
| Lightning Induced Transient Susceptibility | 22.0 | N/A |
| Lightning Direct Effects | 23.0 | N/A |
| Icing | 24.0 | N/A |
| Electrostatic Discharge | 25.0 | A |

## 7.1. Specifications

| | |
|---|---|
| Size | 13.37 x 10.71 inches [339.6 x 272.0mm] |
| Resolution | 1280 w x 1024 h |
| Viewing Angle (U/D/L/R) | 80/80/80/80° |
| Brightness | 200 cd/$m^2$ |
| Contrast Ratio | 400:1 min, 500:1 Typical |
| Video Input | 1Vp-p, 75 ohms |
| Video Standards | NTSC, PAL, SECAM, RS 170 |
| Graphics Standards | VGA through SXGA |

| | |
|---|---|
| Weight | 7.9 lbs ± 5% |
| Installed Dimensions | 15.32” (W) x 12.72” (H) x 1.49” (D)<br>[389.1 mm (W) x 323.1 mm (H) x 37.8 mm (D)] |
| Power Requirements | 28V DC 40W max |
| Operating Temperature | 0ºC - 50ºC |
| Warranty | 2-year |

## 8. REVISION HISTORY

| Revision | Date | Revision Description | EC # |
|---|---|---|---|
| A | 11/26/08 | Initial Release | 08516 |
| B | TBD | Update PIP information in Section 5, add note to sections 4.3 and 4.5 | 09250 |